ABSTRACT

Erosion-corrosion is complex phenomenon which involves the interaction between mechanical process of solid particle erosion and electrochemical process of corrosion. This thesis is investigates the effect of heat treatment on erosion-corrosion. The aims of this project are to investigate the effect of heat treatment on erosion-corrosion of stainless steel in aqueous slurries. Specimens of AISI Type 301 Stainless Steel been annealed heat treated to 1070 °C with slowly cooling type. Two types of specimens which are annealed and control specimens of AISI Type 301 Stainless Steel were prepared to evaluate the erosion-corrosion affected. Erosion-corrosion test then were carried out by immersing those specimens in aqueous 3.5% NaCl solution and presence of 10% sand particles. Velocity, temperature and concentration in aqueous were stated as fixes as we maintain to focus the effect of heat treatment. Erosion-corrosion test undergo specifically was electrochemical test and Potentiostat was choosing as the tools to analyzed corrosion potential rate. Annealed AISI Type 301 Stainless Steel show increased in corrosion rate (mmpy) than control AISI Type 301 Stainless Steel due to decreasing of steel hardness (HRC) after being annealed.

ABSTRAK

Hakisan-kakisan adalah fenomena kompleks yang melibatkan interaksi antara proses mekanikal hakisan zarah pepejal dan proses elektrokimia kakisan. Tesis ini adalah mengenai kesan rawatan haba terhadap proses hakisan-kakisan. Matlamat projek ini adalah untuk mengkaji kesan rawatan haba terhadap hakisan-kakisan keluli tahan karat dalam larutan akueus. Spesimen AISI 301 keluli tahan karat menjalani proses rawatan haba dengan dipanaskan kepada suhu 1070 ° C dan process penyejukan secara perlahan-lahan . Tujuan utama proses penyepuh lindapan adalah untuk melembutkan keluli. Dua jenis spesimen iaitu disepuh lindap dan spesimen kawalan AISI Jenis 301 tahan karat sedia untuk dianalisis terhadap kesan proses hakisan-kakisan . Ujian hakisan -kakisan kemudiannya telah dijalankan dengan merendamkannya spesimen tersebut dalam larutan akueus 3.5% NaCl dan dengan kehadiran 10% zarah pasir. Halaju, suhu dan kepekatan dalam akueus adalah tetap untuk memberi tumpuan kepada kesan rawatan haba. Ujian hakisan-kakisan menjalani ujian elektrokimia dan Potentiostat telah dipilih sebagai alat untuk menilai kadar potensi kakisan yang dianalisis. Jenis disepuh lindap AISI 301 keluli tahan karat menunjukkan peningkatan dalam kadar hakisan-kakisan (mm/tahun) daripada jenis kawalan AISI 301 keluli tahan karat disebabkan penurunan nilai kekerasan keluli (HRC) selepas disepuh lindap.